UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/764,413	01/23/2004	Akiko Yanagita	47539.33	9504

7590   10/04/2007

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ART UNIT	PAPER NUMBER
2624	

MAIL DATE	DELIVERY MODE
10/04/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

PTOL-90A (Rev. 04/07)

	Application No.	Applicant(s)
Office Action Summary	10/764,413	YANAGITA ET AL.
	Examiner	Art Unit	
	Katrina Fujita	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 July 2007*.

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2 and 6-46* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,and 6-46* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)
2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3)☐ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.
5)☐ Notice of Informal Patent Application
6)☐ Other: _____.

DETAILED ACTION

Response to Amendment

1.   This Office Action is responsive to Applicant's remarks received on July 11,

2007. Claims 1, 2, 6-45 and newly added claim 46 are pending.

Specification

2.   The previous specification objection has been withdrawn in light of Applicant's

amendment.

Claim Suggestions

3.   The previous claim suggestions have been withdrawn in light of Applicant's

amendment.

Claim Objections

4.   The previous claims objections have been withdrawn in light of Applicant's

amendment.

Claim Rejections - 35 USC § 103

5.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6.   Claims 1, 2, 7, 9, 11, 13-16, 24, 45 and 46 are rejected under 35 U.S.C. 103(a)

as being unpatentable over the combination of Wang (US 6,434,262) and Kim et al. (US

5,963,665).

Regarding **claims 1, 45 and 46,** Wang discloses medical image processing

system and method ("system and method for detection and identification of

abnormalities in radiological images" at col. 1, line 25) comprising

an image processing section (portion of CAD system 20 that performs steps 50

and 72 in figure 5) for performing image processing including at least gradation

processing ("convert the low-contrast radiological image to a high-contrast image" at

col. 12, line 12) on a medical image (figure 5, numeral 40),

a display formatting section ("CAD system 20, which can be a part of unit 72" at

col. 12, line 39) for transforming the medical image processed in order to generate an

image to be displayed ("CAD system determines how the digital, wide-latitude

radiogram 800 should be printed on a photographic film" at col. 12, line 48), and

an image output section ("output display section of the system for display" at col.

6, line 25) for outputting the image to be displayed to an image recording device (figure

5, numeral 580),

wherein the image processing section generates, based on at least one medical

image obtained by radiographing a subject (figure 5, numeral 600), a plurality of

processed images composed of at least one main image (figure 5, numeral 55) and at

least one sub image generated by reducing the whole of the at least one medical image

(figure 5, numerals 66, 67), and the display formatting section generates one image

(figure 3, numeral 450) to be displayed by synthesizing the main image and the sub

image ("annotation road map 58, the enhanced image tiles 66 and 67, and the digital

mammogram 40 are all displayed on the same TV monitor" at col. 9, line 18),

wherein the image processing section determines an image processing condition

for the main image ("annotation map 55 can be scaled down to a sub-sampled image at

col. 6, line 8) and an image processing condition for the sub image ("generated by

further image processing the regions in the digitized image 40 which correspond to the

CAD detected abnormalities 56 and 57" at col. 6, line 16) respectively by analyzing the

medical image, and generates the plurality of processed images composed of the at

least one main image and the at least one sub image by using the image processing

conditions determined (figure 3, numeral 450; figure 5, numeral 650).

Wang does not teach that the image processing condition includes a gradation

processing condition, and determining the gradation processing condition so as to make

an average gradient of the sub image smaller than an average gradient of the main

image or have an opposite sign value to a value of an average gradient of the main

image.

Kim discloses an image processing condition that includes a gradation

processing condition ("contrast of the image is enhanced" at col. 2, line 16), and

determining the gradation processing condition so as to make an average gradient of

the sub image smaller than an average gradient of the main image and have an

opposite sign value to a value of an average gradient of the main image ("input samples

which are equal to or less than the mean level Xm are mapped into a gray level of from

0 to Bm" at col. 5, line 25; figures 4A, 4B, 5A and 5B).

It would have been obvious at the time the invention was made to one of ordinary

skill in the art for the image processing condition of Wang to include and determine the

gradation condition of Kim as described above, such that "the mean brightness of the

given image is preserved while the contrast of the image is enhanced" (Kim at col. 2,

line 1).

Regarding **claim 2**, Wang discloses a system further comprising a diagnosis aid

information generating section (figure 5, numeral 50) for generating diagnosis aid

information (figure 5, numerals 56 and 57; "CAD-detected abnormalities 56 and 57" at col. 5, line 66) by analyzing the medical image, wherein the display formatting section adds annotation ("annotated road maps 58 and the enhanced image tiles 66 and 67 can also be printed at the edge or margin of the mammogram 650" at col. 1, line 54) corresponding to the diagnosis aid information generated by the diagnosis aid information generating section to the at least one sub image (figure 5, numeral 58).

Regarding **claim 11**, Wang discloses a system wherein the diagnosis aid information generating section performs an image measurement on the medical image ("abnormal feature detection algorithms used in the abnormal feature detection stage" at col. 6, line 44), and generates the diagnosis aid information including location information in regard to a result of the image measurement in the medical image ("emphasize the abnormal features of the CAD detected abnormalities" at col. 6, line 46).

Regarding **claim 14**, Wang discloses a system further comprising a diagnosis aid information storage section (figure 5, numeral 70; "memory storage unit 70") for storing the diagnosis aid information as related to image data of the medical image ("annotation map 55, the miniaturized annotated road map image 58, the enhanced image tiles 66 and 67…can be stored for later use" at col. 6, line 19), wherein the display formatting section loads the diagnosis aid information stored in the diagnosis aid information storage section ("annotated road maps 58 and the enhanced image tiles 66 and 67 can also be printed at the edge or margin of the mammogram 650" at col. 1, line 54), and

externally inputting information in order to assign whether the sub image is to be

displayed or not ("enhanced image tiles 66 and 67 can also be toggled (switch not

shown) on and off" at col. 9, line 26), wherein the display formatting section generates

the image to be displayed with the sub image displayed or an image to be displayed

without the sub image displayed on the basis of the sub image display assigning

information inputted externally ("annotation road map 58 may alternatively be displayed

by overlaying it on top of the digital mammogram 40. This overlay may be toggled

(switch not shown) on and off" at col. 9, line 22).

Regarding **claim 13**, Wang discloses a system further comprising

an image display section for displaying on a monitor, the image to be displayed

generated by the display formatting section (figure 5, numeral 900);

an image to be displayed modifying information input section ("toggle switch" at

col. 7, line 17) for externally inputting modifying information for modifying the image to

be displayed ("enhanced image tiles 66 and 67 can also be toggled (switch not shown)

on and off" at col. 9, line 26); and

a display image modifying section for modifying the image to be displayed on the

basis of the image to be displayed modifying information inputted externally ("annotation

road map 58 may alternatively be displayed by overlaying it on top of the digital

mammogram 40. This overlay may be toggled (switch not shown) on and off" at col. 9,

line 22).

Regarding **claim 15**, Wang discloses a system further comprising an image

processing condition storage section (figure 5, numeral 72) for storing an image

generates the image to be displayed on the basis of the diagnosis aid information
(figure 5, numeral 650).

Regarding **claim 24**, Wang discloses a system wherein the diagnosis aid
information generating section generates a plurality of pieces of diagnosis aid
information different from one another based on the same medical image (figure 5,
numerals 66, 67), and the image processing section generates the at least one sub
image per each of the plurality of pieces of diagnosis aid information (figure 5, numerals
56, 57; figure 5, numerals 66, 67).

Regarding **claim 7**, Wang discloses a system further comprising an image
recording device information storage section ("output display section" at col. 9, line 8)
for storing image recording device information corresponding to the image recording
device ("guide into two different display media the display resulting from converting a
low-contrast image into a high-contrast image where needed" at col. 12, line 40),
wherein the image processing section determines an image processing condition based
on an analysis result of the medical image ("uses information regarding the suspected
abnormalities that were automatically found by unit 50 to automatically convert the low-
contrast radiological image to a high-contrast image" at col. 12, line 10) and the image
recording device information ("switch 71 is set to send the low-contrast, wide latitude
radiological image and information about the suspected abnormalities through a
processor 72" at col. 12, line 4).

Regarding **claim 9**, Wang discloses a system further comprising a sub image
display assigning information input section ("toggle switch" at col. 7, line 17) for

processing condition of image processing as related to image data of the medical image

("automatically convert the low-contrast radiological image to a high-contrast image at

the density range(s) corresponding to the abnormalities" at col. 12, line 12), the image

processing performed on the medical image by the image processing section,

wherein the image processing section loads the image processing condition

stored in the image processing condition storage section ("CAD system 20, which can

be a part of unit 72 in FIG. 5, is used guide into two different display media" at col. 12,

line 39), and generates the plurality of processed images on the basis of the image

processing condition.

Regarding **claim 16**, Wang discloses a system further comprising a display

format storage section (figure 5, numeral 70; "memory storage unit 70") for storing a

condition applied on the image for display applied on the medical image by the display

formatting section, or image data of the image to be displayed generated by the display

formatting section, as related to image data of the medical image ("CAD system

determines how the digital, wide-latitude radiogram 800 should be printed on a

photographic film" at col. 12, line 48)

wherein the display formatting section loads at least a condition applied on the

image for display stored in the display format storage section or data of the image to be

displayed in order to generate the image to be displayed ("transferred to an output

display section of the system for display" at col. 6, line 25).

7.   Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Wang and Hirayama (US 7,054,036).

8.   Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Wang and Kim et al. as applied to claim 1 above, and further in view of Hirayama (US 7,054,036).

The Wang and Kim et al. combination teaches the system of claim 1 including the image processing condition and the image processing section.

The Wang and Kim et al. combination does not teach that the image processing condition includes a frequency processing condition and determining the frequency processing condition so as to make low frequency components of the sub image have smaller amount than low frequency components of the main image.

Hirayama discloses an image processing condition that includes a frequency processing condition ("degree of sharpness is adjusted" at col. 7, line 52) and determining the frequency processing condition so as to make low frequency components of the sub image have smaller amount than low frequency components of the main image ("vary the sharpness in units of an area" at col. 8, line 3; "increase or decrease the sharpness" at col. 7, line 61).

It would have been obvious at the time the invention was made to one of ordinary skill in the art for the image processing condition of the Wang and Kim et al. combination to include and determine the frequency condition of Hirayama as described above, in order "to provide an image processing method and an image forming apparatus capable of achieving a high image quality" (Hirayama at col. 1, line 32).

9.   Claims 8 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over

the combination of Wang and Kim et al. as applied to claim 1 above, and further in view

of Kupinski et al. (US 6,138,045).

The Wang and Kim et al. combination teaches the system of claim 1 including

the image processing section for analyzing the medical image and generating the at

least one sub image and a display formatting section that loads the image data stored in

order to generate the image to be displayed on the basis of the image data.

The Wang and Kim et al. combination does not teach a schema image

generating section for automatically generating a schema and the at least one sub

image including the schema and a schema image storage section for storing image data

of the schema.

Kupinski teaches a schema image generating section ("processor 320" at col. 12,

line 1) for automatically generating a schema (figure 1, "generate contours"; figures 8A,

and 8B) and the at least one sub image including the schema ("sub-image or region of

interest (ROI) of dimension n by m containing the suspect lesion" at col. 5, line 11) and

a schema image storage section ('a hard disk 310" at col. 11, line 62) for storing image

data of the schema ("Such computer readable media further includes programming or

software instructions to direct the general purpose computer 300 to perform tasks in

accordance with the present invention" at col. 12, line 15).

It would have been obvious at the time the invention was made to one of ordinary

skill in the art to modify the image processing unit of the Wang and Kim et al.

combination using the contour generation taught by Kupinski as described above, for

"improved computerized segmentation and discrimination of lesions" (Kupinski at col. 1,

line 16).

10.   Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over the

combination of Wang and Lobiondo (US 5,287,194).

11.   Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over the

combination of Wang and Kim et al. as applied to claim 1 above, and further in view of

Lobiondo (US 5,287,194).

Wang teaches an output channel selecting section ("switch 73" at col. 12, line 18)

for selecting any one among the plurality of output channels to which an image is

outputted; and an image recording device information storage section for storing image

recording device information of the image recording device set per each of the output

channels, the display formatting section generates the image to be displayed on the

basis of the image recording device information which corresponds to the output

channel selected by the output channel selecting section, and which is stored in the

image recording device information storage section.

The Wang and Kim et al. combination does not teach a plurality of image

recording devices.

Lobiondo teaches a plurality of image recording devices ("multiple printers 10 for

a single job, among a plurality of local and remote printers 10 attached to the network".

at col. 4, line 17).

It would have been obvious at the time the invention was made to one of ordinary

skill in the art to modify the image output section of the Wang and Kim et al.

combination using the multiple printer network taught by Lobiondo as described above,

to "take full advantage of the printer systems capacities" (Lobiondo at col. 4, line 21).

12.   Claims 10, 25-30, 38 and 41 are rejected under 35 U.S.C. 103(a) as being

unpatentable over the combination of Wang and Kim et al. as applied to claims 1 and 2

above, and further in view of Takeo et al. (US 2002/0041702).

Regarding **claims 10, 25 and 28**, Wang discloses a system further comprising

a modality for generating the medical image by radiographing the subject

("mammographic x-ray film acquired with a conventional mammographic film-screen

imaging system" at col. 5, line 31),

a synthesized image generating section for recognizing subject area of the main

image generated and for locating at least one of the reduced medical image and the

reduced abnormality displayed image with information of the subject area recognized in

the main image maintained in order to synthesize the main image with at least one of

the reduced medical image and the reduced abnormality displayed image as the sub

image into a synthesized image ("annotation road map 58 and the enhanced image tiles

66 and 67 are shown in FIG. 4 placed at the same edge or margin of the printout film as

the patient information label 12" at col. 9, line 41),

wherein the image processing section comprises a reduced medical image

generating section (portion of CAD system 20 that performs steps 50 and 72 in figure 5)

for reducing at a predetermined magnifying rate ("annotation map 55 can be scaled

down to a sub-sampled image, say 512 x 512 pixel in size and 8-bit in gray scale, of the

digitized image 40" at col. 6, line 8), the whole of the medical image, in order to

generate a reduced medical image as the sub image, and the display formatting section

comprises:

a reduced abnormality displayed image generating section ("CAD system 20,

which can be a part of unit 72" at col. 12, line 39) for overlapping at least annotation

information as the result of the detection of the abnormal candidate in order to generate

the reduced abnormality displayed image on the reduced medical image generated by

the reduced medical image generating section, the annotation information indicating a

location of the abnormal candidate ("annotated road maps 58 and the enhanced image

tiles 66 and 67 can also be printed at the edge or margin of the mammogram 650" at

col. 1, line 54); and

wherein the diagnosis aid information generating section detects abnormalities in

the medical image and generates the diagnosis aid information including location

information in regard to the abnormalities detected in the medical image.

The Wang and Kim et al. combination does not teach detecting an abnormal

shadow candidate, generating location information in regard to the abnormal shadow

candidate and overlapping annotation information as a result of the detection of the

abnormal shadow candidate on the image.

Takeo discloses a system wherein an abnormal shadow candidate is detected

(figure 8, numeral 30) and location information in regard to the abnormal shadow

candidate is generated and overlapping a result of the detection of the abnormal

shadow candidate on the image (figure 1a).

It would have been obvious at the time the invention was made to one of ordinary

skill in the art to modify the abnormal feature detection unit of the Wang and Kim et al.

combination using the shadow detection means taught by Takeo as described above,

such that "stable detection capability can be obtained regardless of differences between

the image obtaining environments of said facilities" (Takeo at paragraph 0071, line 11).

Regarding **claim 26**, Wang discloses a system further comprising an obtaining

section (figure 5, numeral 15) for obtaining at least one of another modality image of the

same radiographic part of the same subject, generated by a modality other than the

modality that has generated the medical image ("magnetic resonance imaging ("MRI")

systems, computed tomography ("CT") systems, ultrasound imaging systems" at col. 8,

line 28) and a past medical image generated by the same modality (a previously printed

film can be inputted into the CAD system); and

an obtained image storage section (figure 4, numeral 70) for storing at least one

of the other modality image obtained and the past medical image obtained ("annotation

map 55, the miniaturized annotated road map image 58, the enhanced image tiles 66

and 67...can be stored for later use" at col. 6, line 19),

wherein the image processing section comprises an obtained image processing

section (portion of CAD system 20 that performs steps 50 and 72 in figure 5) for loading

at least one of the other modality image and the past medical image from the obtained

image storage section, and for reducing at the predetermined magnifying rate, the

image loaded in order to generate the reduced medical image as the sub image, and

at least one of the reduced medical image and the reduced abnormality

displayed image to be synthesized with the main image by the synthesized image

generating section is any one of the images indicated by the following items (1) to (5),

(1) a reduced medical image of the same medical image as the main image; (2) a

reduced abnormality displayed image of the same medical image as the main image;

(3) a reduced medical image of another medical image related to the medical image of

the main image; (4) a reduced abnormality displayed image of another medical image

related to the medical image of the main image; and (5) a reduced medical image

obtained from the obtained image processing section.

Regarding **claim 27**, Wang discloses a system wherein the obtained image

processing section performs at least one among gradation processing, frequency

processing and processing for adding information indicating a modality type in an

image, on the reduced other modality image.

Regarding **claim 30**, Wang discloses a system wherein the obtained image

processing section further analyzes at least one of the other modality image reduced

and the past medical image reduced in order to recognize each subject area, and

performs density correction so as to make area other than the each subject area

recognized have more than predetermined density.

Regarding **claim 29**, Wang discloses a system wherein the reduced image

generating section further recognizes the subject area by analyzing the reduced medical

image ("around the CAD detected abnormality 890, say around relative exposure 30, is

provided at the optimum contrast gradient (say G=3.0) while other image content, above

or below the exposure range of the CAD detected abnormality 890, are compressed in

display latitude and are displayed with reduced contrast gradient" at col. 12, line 59),

and performs density correction so as to make area other than the subject area

recognized have more than predetermined density (figure 5, numeral 72).

Regarding **claim 38**, Wang discloses a system wherein when at least one of a

plurality of the reduced medical images and a plurality of the reduced abnormality

displayed images are synthesized with the main image, the synthesized image

generating section performs size adjustment on each of the images to be synthesized

with the main image so as to make the image to be synthesized have the same size

(figure 5, numeral 600; "Enhanced image tiles 66 and 67, centered respectively around

the CAD-detected abnormalities 56 and 57, say 512 x 512 pixel" at col. 8, line 64).

Regarding **claim 41**, Wang discloses a system further comprising an assigning

section (figure 1, numeral 90) for assigning whether the reduced medical image is set

as the sub image or the reduced abnormality displayed image is set as the sub image

("the miniaturized annotated road map 58 and the enhanced image tiles 66 and 67 are

alternatively or sequentially displayed as images 300x, by operating a toggle switch" at

col. 7, line 15).

13.   Claims 18-22 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable

over the combination of Wang and Kim et al. as applied to claim 1 above, and further in

view of Nelson (US 6,381,352).

Wang teaches an image size adjusting section (portion of CAD system 20 that

performs steps 50 and 72 in figure 5) for performing size adjustment on the main image

("annotation map 55 can be scaled down to a sub-sampled image at col. 6, line 8)

wherein the image size adjusting section performs the size adjustment so as to make an

image size of the sub image smaller than an image size of the main image,

and an image synthesizing section for synthesizing the main image and the sub

image so as to fit the sub image into a predetermined area in the main image wherein

the location for fitting the sub image is determined on the basis of image attribute

information of the medical image (figure 5, numeral 650) according to a ratio between

the subject area and area other than the subject area in the main image ("Enhanced

image tiles 66 and 67, centered respectively around the CAD-detected abnormalities 56

and 57, say 512 x 512 pixel" at col. 8, line 64; enhanced image tiles 66 and 67 are

shown in FIG. 4 placed at the same edge or margin of the printout film as the patient

information label 12" at col. 9, line 42)

wherein the display formatting section comprises a subject area recognizing

section for recognizing a subject area by analyzing the medical image, and the image

synthesizing section determines a location into which the sub image size-adjusted is to

be fitted on the basis of information of the subject area recognized and

wherein the image size adjusting section adjusts the image size of the sub image

on the basis of the information of the subject area recognized.

The Wang and Kim et al. combination does not teach performing size adjustment

on the sub image.

Nelson discloses a method of performing size adjustment on the sub image

("sub-image can then be re–scaled" at col. 2, line 1).

It would have been obvious at the time the invention was made to one of ordinary

skill in the art to modify the size adjusting section of the Wang and Kim et al.

combination using the resizing taught by Nelson as described above, such that the user

can review the images "for improved contrast of the relevant subject matter as

compared to the initial image" (Nelson at col. 2, line 2).

14.   Claims 31 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable

over the combination of Wang, Kim et al. and Takeo as applied to claims 25 and 26

above, and further in view of Kallergi et al. (US 6,630,937).

The Wang, Kim et al. and Takeo combination discloses a reduced medical image and a reduced abnormality image generated by the reduced medical image generating section.

The combination does not teach a size information adding section for adding at least one of scale calibration and information indicating a reduction ratio.

Kallergi discloses a system comprising a size information adding section ("appropriate buttons 413,414 on the controls" at col. 6, line 53) for adding at least one of scale calibration and information indicating a reduction ratio ("a measuring ruler 80" at col. 6, line 52; figure 8).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify the user interface of the Wang, Kim et al. and Takeo combination using the ruler taught by Kallergi as described above, to provide the user with "tools that will provide measurements of the dimensions of a suspicious region" (Kallergi at col. 6, line 50).

15.   Claims 33-36, 39, 40 and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Wang, Kim et al. and Takeo as applied to claim 25 above, and further in view of Bodicker et al. (US 2002/0193676).

Regarding **claims 33 and 34**, the Wang, Kim et al. and Takeo combination discloses a system wherein information inputted to the image to be displayed is

outputted by the image output section and a storage section for storing information as related to the medical image to be set as the main image.

The combination does not teach a findings information input section for inputting findings information corresponding to the image to be displayed, a findings information adding section for adding the findings information inputted to the image to be displayed to be outputted by the image output section and the storage section storing information inputted from the findings information input section.

Bodicker discloses a system wherein a findings information input section (figure 1, numerals 23 and 24) for inputting findings information corresponding to the image to be displayed ("if the radiologist needs to perform actions during the screening procedure...this can be done by means of a keypad and/or keyboard" at paragraph 0017, line 1); and

a findings information adding section for adding the findings information inputted to the image to be displayed to be outputted by the image output section ("entering of an annotation or a diagnosis" at paragraph 0017, line 6); and

a storage section storing information inputted from the findings information input section (figure 1, numeral 16).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify the user interface of the Wang, Kim et al. and Takeo combination using the additional information input taught by Bodicker as described above, such that the user can review the images "without distraction of attention due to the complexity of the user interface" (Bodicker at paragraph 0010, line 5).

Regarding **claims 35 and 36**, the Wang, Kim et al. and Takeo combination discloses a system herein, when the main image is mammography, the synthesized image generating section locates at least one of the reduced medical image as the sub image and the reduced abnormality displayed image as the sub image in the main image in order to synthesize the images.

The combination does not teach the images being any one of the following pair forms: (MLO(oblique direction) -R (right breast), L(left breast)), (CC(vertical direction)-R, L), (CC-R, L), (MLO-R, L), (MLO-R, CC-R), (MLO-L, CC-L), (MLO-L, CC-L), and (MLO-R, CC-R).

Bodicker teaches the images being any one of the following pair forms: (MLO(oblique direction) -R (right breast), L(left breast)), (CC(vertical direction)-R, L), (CC-R, L), (MLO-R, L), (MLO-R, CC-R), (MLO-L, CC-L), (MLO-L, CC-L), and (MLO-R, CC-R) (Table 1).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify the display of the Wang, Kim et al. and Takeo combination using the image pairs taught by Bodicker as described above, to allow the user to view more diagnostically relevant information at once.

Regarding **claim 39**, the Wang, Kim et al. and Takeo combination discloses a system wherein the synthesized image generating section recognizes the subject area of the main image and performs synthesis so as to make relative location relation between the subject area recognized and at least one of the reduced medical image

and the reduced abnormality displayed image in the main image have the same

appearance or symmetric appearance.

The combination does not teach a main image composed of two images at a left

side and a right side.

Bodicker teaches a main image composed of two images at a left side and a right

side (figure 5, numerals 38 and 39).

It would have been obvious at the time the invention was made to one of ordinary

skill in the art to modify the display of the Wang, Kim et al. and Takeo combination using

the tiling taught by Bodicker as described above, to allow the user to view more

diagnostically relevant information at once.

Regarding **claims 40, and 42-44**, the Wang, Kim et al., Takeo and Bodicker

combination of claim 34 teaches

at least one modality,

a managing device for storing and managing medical images generated by the at

least one modality as related to accompanying information thereof (Bodicker, at figure 1,

numeral 16), and

a medical image set as the main image and a medical image set as the sub

image generated in the same examination by the modality among the medical images

stored in the managing device,

displaying a list of the medical images extracted on a display screen as sub

image candidates (Wang, at figure 5, 650; image tiles 66 and 67) and

selecting a medical image to be set as the sub image among the sub image

candidates displayed ("the enhanced image tiles 66 and 67 are alternatively or

sequentially displayed as images 300x, by operating a toggle switch", Wang at col. 7,

line 16).

The combination does not teach a selecting section for selecting the images from

among a plurality of medical images generated under different radiographing conditions

wherein the selecting section is capable of selecting a plurality of sub images

corresponding to the main image and extracts medical images related to the main

image from at least one of the medical images generated by the at least one modality

and the medical images stored in the managing device on the basis of the

accompanying information.

Bodicker further teaches a selecting section ("user can select an icon by clicking

on it" at paragraph 0012, line 5) for selecting the images from among a plurality of

medical images generated under different radiographing conditions (Table 1) wherein

the selecting section is capable of selecting a plurality of sub images corresponding to

the main image ("marking of regions of interest" at paragraph 0017, line 6) and extracts

medical images related to the main image from at least one of the medical images

generated by the at least one modality and the medical images stored in the managing

device on the basis of the accompanying information (Table 1).

It would have been obvious at the time the invention was made to one of ordinary

skill in the art to modify the display of the Wang, Kim et al. and Takeo combination using

the user interaction taught by Bodicker as described above, to allow the user to choose

which diagnostically relevant information to view.

Response to Arguments

Summary of Remarks (@ response page labeled 16): The Kim reference does

not disclose that the "average gradient of the sub image for a reference purpose be

smaller than the average gradient of the main image" and "have a sign value opposite to

a value of the average gradient of the main image".

Examiner's Response: Regarding making the average gradient of the sub image

smaller than the average gradient of the main image, referring to Figure 4A, input

values reasonably close to the average brightness of the main image result in a

mapping to the average brightness value. As such, a sub image with values at the

average brightness value will result in mapped sub image with no change in contrast.

As other sub images in the main image are mapped, the dynamic ranges of the bright

and dark portions are increased (refer to col. 5, lines 33-36), thereby increasing the

overall contrast of the main image. Consequently, the average gradient of the main

image is higher than the average gradient of the sub image at the average brightness

value.

Regarding making the average gradient of the sub image have a sign value

opposite to a value of the average gradient of the main image, take, for example, the

case of a main image composed of two sub images, one black and the other white.

The average brightness of the image would be a mid-value grey intensity, around 127 or

128. Looking at Figure 5A, the values of the black sub image would be mapped to a

value slightly higher than the average brightness and the white sub image would be

mapped to a value slightly lower than the average brightness. Thus, the average

gradient of the main image has been inverted and has an opposite sign value to the

sign value of the sub images.

Conclusion

16. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time

policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

17.   Any inquiry concerning this communication or earlier communications from the examiner should be directed to Katrina Fujita whose telephone number is (571) 270-1574. The examiner can normally be reached on M-Th 8-5:30pm, F 8-4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian P. Werner can be reached on (571) 272-7401. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Katrina Fujita
Art Unit 2624

BRIAN WERNER
SUPERVISORY PATENT EXAMINER